1996 Subject/Author Index

This index
describes the
contents of
Chemical
Engineering
Progress,
Volume 92,
Numbers 1
through 12. An
index of
contributing
authors begins
on page 111.

This subject index is available for \$5 on 5% and 3% in. disks in ASCII format for DOS and Macintosh systems. Order from Karen Simpson, Assistant Editor, CEP, 345 E. 47 St., New York, NY 10017. Make checks payable to AIChE.

A

Abnormal Situation Management Consortium working on technologies to restore control after process upsets, May 9 Academia, threats to professionalism.

Oct. 80
Acid gas absorption process, Mar. 17

Acids, low-concentration, liquid/liquid extraction for, Apr. 57

Agglomerated products, advantages of, Apr. 32

Agglomeration binding mechanisms of, Apr. 30 pressure, Apr. 35, 43 process, selection of, Apr. 37 for size enlargement, Apr. 29 tumble and growth, Apr. 33, 42

Annual Student Conference in Miami Beach, Jan. SI Student Annual Program at Chicago Meeting, Oct. SI Student Poster Paper Session, Seventh Annual, Sept. S13

Student Regional Conferences, sampling of, S1

automobile emissions clean up, Jan. S9 global climate agreement opposed by industry, Sept. 23 Air pollution regulations, obsolete, eliminated by EPA, June 22

EPA, June 22
Air quality databases of EPA, July 72
Alloys for caustic soda service, May 48
Aluminum, method of depositing wear-resistant

materials onto, July 19
ANSI/NFPA standard for purged and pressurized equipment. Feb. 61

Aqueous surfactants and aluminum disoap in hydrocarbon solutions, drag reduction asymptote for, Dec. 16 Aromatics

destruction by incineration, Nov. 15 removing from soil, Nov. 13 Audit immunity and privilege laws, EPA offers guidance on, June 22

Audits, process safety, new paradigm for, June 61 Automobile emissions clean up, Jan. S9

An "S" preceding a page number cites an item in ChAPTER ONE, AIChE's student publication that is bound into CEP issues sent to undergraduates.

B

Baffling

calculations for shell-and-tube heat exchangers, Apr. 73

for condensers, Apr. 79 for reboilers, Apr. 79

Barrier/isolation technology for containment in batch operations, Dec. 72

Basic Extractive Sludge Treatment process for cleaning contaminated waters, Aug. 14 Batch operations, barrier/isolation

technology for containment in, Dec. 72.
Batch reactor relief system sizing. Apr. 46.
Batteries for underwater vehicles, July 23.
Benzo[a]pyrene, incineration of, Nov. 17.
Biofouling, lipid-based microtubule system.

for controlling, Mar. 17 Bioprocess Engineering Principles, book review, May 78

Bioremediation of benzo[a]pyrene by incincration, Nov. 17 for mercury pollution, Jan. 16 of soil, Aug. 17

Biosensor detects force between molecules, May 16

Bleach Filtrate Recycle technology for reducing waste effluents in bleaching pulp, Feb. 18 Blenders

batch, Nov. 73 continuous, Nov. 78 Boiler cleaning deposit formation, Sept. 72

safety considerations, Sept. 77 solvents for, Sept. 74 Book reviews

Bioprocess Engineering Principles, May 78 Chemicals, Metals and Men, Gas, Chemicals and Coke – A Bird's Eye View of the Materials That Make the World

Go Around, Mar. 69 Developing Effective Safety Systems, Apr. 93

Engineering Your Writing Success: How Engineers Can Master On-The-Job Communication Skills, Dec. 79 English-German Dictionary of Materials

and Process Engineering, Sept. 82 English-Spanish Glossary of Environmental Terms, book review, Sept. 82 Environmental Management: Issues and

Solutions, book review, Apr. 93 Fluid Flow for Chemical Engineers, Nov. 82 Handbook of Double Containment Piping Systems, Oct. 92 [Book reviews] Heat Exchanger Network Synthesis: Process Optimization by Energy and Resource Analysis, June 67 How to Study, Jan. S8 Industrial Mixing Fundamentals With Applications, May 78 Lightning Never Strikes Twice and Other False Facts, Oct. S8 Major in Success, Jan. S8 The Physics of Star Trek, Sept. S12 Plastics: Product Design and Process Engineering, Sept. 82 Pollution Prevention via Process and Product Modifications, Feb. 84 Proceedings of the International Symposium on Runaway Reactions and Pressure Relief Design, Feb. 84 Risk Assessment and Management Handbook for Environmental Health and Safety Professionals, June 68 Safety and Health Management in the Nineties: Creating a Winning Program. May 78 Safety Engineering, Mar. 69 Safeware: System Safety and Computers, Jan. 81 Successful Industrial Experimentation, Aug. 88 The Thermodynamics of Pizza, Nov. S8 Total Quality for Safety and Professional Health, Aug. 88 What You Can Learn from Things That Go Wrong, June 67 Bulk solids, level measurement devices for, Feb. 50 Burner for sulfur recovery commercialized, Dec. 22

1,3-butadiene, permissible exposure level

Cancer risk assessment guidelines revised by

reduced for, Dec. 26

EPA, June 22 Capital cost estimating, June 26 Carbon measured in ash of coal burning plants, May 20 Career fair of Georgia Tech, Nov. S5 Career Paths Panel highlights, Apr. S1 consulting, May 25 contract engineering. May 36 Catalysts chemical cleaning of, Mar. 41 design of for catalytic oxidizer. Mar. 40 microreactors for testing of, Apr. 17 oxidation, for combustion of VOCs, Mar. 39 physical cleaning of, Mar. 41 thermal deactivation of, Mar. 41 Catalytic extraction process for pollution prevention and recycling, Feb. 19 Catalytic oxidation capabilities of, Mar. 38 for controlling VOCs, Mar. 37 of halogenated VOCs, Mar. 42 Caustic soda service, alloys for, May 49 Cavitation and bubble dynamics, July 57 damage, Sept. 31 factors affecting, July 58 harnessing of to improve processing, July 57 hydrodynamic, July 66 CD-ROMs for teaching thin-film technologies, Nov. S7

Oct. 11 Coatings Concrete

[CD-ROMs] Mar 58 Chemicals Clean Air Act Jan. S9 Feb. 22 Nov. 54 Nov. 27

fully extractive systems, Feb. 30

for safety and health training, Sept. 45 Centrifugal pumps, proper warm up of, Jan. 42 CRADA formed on, Apr. 21 binder solidifies hazardous waste, Dec. 23 May 61 Cooling towers ChemCad III software used to solve salt dilution problem in tanks, Mar. 45 Chemical cleaning of boilers, Sept. 74 evaporative sys Chemical engineers, salaries continue steady rise, Aug. 109 Chemical kinetic scheme, development of, Chemicals, Metals and Men, Gas, Chemicals and Coke - A Bird's Eye View of the Materials That Make the World Go scientists, Feb. S7 Corrosion Around, book review, Mar. 69 organic, to be regulated by new source performance standards, Apr. 26 reporting of use data may be expanded by clad steel, July 40 EPA, Dec. 24 Chinese and U.S. putent law, Jan. 18 Chlorine, replacement of in bleaching, D Amendments, history and provisions of, Databases, EPA. air quality, July 71 on diskette, July 74 Fedworld, July 73 congressional action on, Feb. 22 refrigeration leak repair regulations training module developed, Mar. 21 Riss Management Program gu documents issued by EPA, Mar. 21 Clean air policy, history of, Jan. S9 Clean Water Act, congressional action on, Climate agreement, global, opposed by industry, Sept. 23 Coal-fired plants carbon measured in byproduct ash, May 20 mercury control emissions technology concepts, Feb. S5 May 22 for May 20 Coal gas, sorbent removes sulfur compounds from, May 16 major, Oct. S7 acrylics, Nov. 58 inorganic zinc, Nov. 57 Feb. 48 lead paint, removal of, Jan. 50 maintenance, without volatile compounds, systems, selection of for plants, Aug. 81 options, June 43 for secondary containment concrete, Feb. 56 urethane/water systems, Nov. 58 energy, Aug. 19 Column, distillation, debottlenecking options for, June 42 Compliance Assurance Monitoring regulation issued by EPA, Oct. 32 Composites, laminated matrix, Jan. 9 Compressor drives, selection of, Feb. 47 Compressors, gas-barrier seals for, Oct. 58 chemicals, effect of on, Feb. 58 coatings for, Feb. 56 Feb. 72 guidelines for longevity for, Sept. 54 phenolic/novalic resin coating for, Feb. 59 retirement benefits acted on, June 20 work left undone, Feb. 22 Congress acts on employee benefits. Consulting as a career, May 25 Containment in butch operations barrier/isolation technology for, Dec. 72 hydrocarbon solutions, Dec. 16 Dust explosions, suppression of, Mar. 22 Continuous emissions monitori ing systems data handling for, Feb. 33 Dynamic problems, simulation and statistical



E

Economics
capital cost estimation for plants, June 26
of distillation-column debottlenecking
options, June 45

and materials selection, June 38 payout period method for screening projects, June 33

CD-ROM for teaching thin-film technologies, Nov. S4 ChE, reforms needed, Oct. 84 co-op programs, advantages of, Sept. S8 Energy, Environment, and Economics Program at Illinois Institute of

Technology, Feb. S6
Envisioneer program at Penn State for improving engineering education, Mar. S6 game teaches design concepts, Feb. S5 graduates school on CD-ROM, Sept. S12 international exchange program, Dec. S1 MBA degree for engineers and scientists at Cornell Univ., Feb. S7

minority engineering enrollments increase, July 15 placement offices evaluated by students,

July 15 quality of threatened, Oct. 80 Small Business Job Protection Act exempts workers from tax on educational aid from employers, Nov. 27 Virtual Rer 'ity in Chemical Engineering Education Lab, Nov. S1

Electrical equipment, pressurization for protection of in flammable atmospheres, Feb. 61 Electrochemistry for pollution prevention,

Electrokinetic technology for soil decontamination, Oct. 22 Electromagnetic filters, May 59 Electromics, nanoscale, Nov. 13 Emergency Planning and Community Right-to-Know Act, seven industry

requirements, Aug. 28
Emergency response plan guidance issued by government agencies, July 27

Emissions monitoring of ambient air, Feb. 36 and Code of Federal Regulations, Feb. 36 continuous emissions monitoring systems, advantages of, Feb. 29 contractor selection for, Feb. 36 fugitive, Feb. 36 of indoor air, Feb. 36 soliciting bids for, Feb. 36

soliciting bigs for, reo. 36 stationary source testing, Feb. 36 Employee benefits, Congress acts on, Nov. 27 Employment

career fair of Georgia Tech, Nov. 55
Career Paths Panel highlights, Apr. S1
consulting as a career, May 25
contract engineering, May 36
foreign cultures, tips on working in, Dec. S7
graduates competing for fewer jobs, July 14
graduates face tougher job market, July 13
interviewing techniques for job
applicants, June 94

job search, don't delay after termination or graduation, Mar. 95 job seekers Internet sites. Apr. S6 salary and benefits negotiations, June 95 starting a new job, June 96 survey on workload, Apr. 64 transition to a new job, June 92 [Employment] workplace environment, survey on, Nov. 104 Energy, Environment, and Economics Program

at Illinois Institute of Technology, Feb. S6 Energy, fuel cells as a source of, Sept. 11

Energy, fuel cells as a source of, Sept. 11 Energy/transfer conversion, heating systems, hot oil, troubleshooting, Dec. 62

Energy transfer/conversion buffling calculations for sheli-and-tube heat exchangers, Apr. 72 band heaters in plastics processing, May 39 boilers, chemical cleaning of, Sept. 72 cooling towers, evaporative. Oct. 50 furnace safety interlocks, July 45 heat exchangers, brazed, use of, Nov. 44 heat pumps for CPI applications, Feb. 42 heat transfer fluid mist explosions, Mar. 52.

Engineering Your Writing Success: How Engineers Can Master On-The-Job Communication Skills, book review, Dec. 79

Engineers
in the global marketplace, Dec. S6
MBA degree for, at Cornell Univ. Feb. S7
Engineers Week launches billboard campaign,
Sept. S11

English-German Dictionary of Materials and Process Engineering, book review, Sept. 82

English-Spanish Glossary of Environmental Terms, book review, Sept. 82 Environmental legislation, prospects for, Mar. 20

Environmental protection catalytic oxidation for controlling VOCs, Mar. 37 EPA databases for environmental problems, July 70

guidewords to identify pollution prevention opportunities, Aug. 74 instruments for level measurement, Oct. 70 liquid/liquid extraction for solving wastewater problems, Apr. 56 odor problems of plants, identifying and solving, Jan. 35

solving, Jan. 59.

guidewords for identifying, Aug. 74

Prince William Sound cleanup after

Valdez oil spill, Mar. S1

product stewardship, customize with help

from chemical suppliers, Sept. 50

risk analysis and prioritization, Jan. S12

Risk Management Program Rule of EPA

provisions, Aug. 74

soft sensors for, Dec. 14

VOC emissions control for aboveground storage tanks, May 42 waste minimization, integration of in R&D and design, June 58 Environmental Protection Agency

air pollution regulations, obsolete, eliminated, June 22 audit immunity and privilege laws, guidance offered on, June 22 chemical use data, reporting of may be expanded, Dec. 32 compliance assurance monitoring rule issued, Oct. 32 databases for solving environmental

problems, July 70
FY97 budget request, May 22
hazardous waste facilities, regulation
would ease access to information
regarding, Jan. 21

hydrochloric acid release reporting requirements reduced, Sept. 24 [Environmental Protection Agency] National Emission Standards for Hazardous Air Pollutants for polymers and resins finalized by EPA, Aug. 28 National Emission Standards for Hazardous Air Pollutants source category list expanded, Aug. 28 ozone and particulate matter standards,

revision of linked by EPA, Aug. 25
PCB import rules loosened, May 24
perchloroethylene determined not to be a
VOC, Apr. 26

refrigeration leak repair regulations training module developed, Mar. 21 regulations clarified on organic chemicals to be regulated by new source performance standards, Apr. 26 risk assessment guidelines revised, June 22

Risk Management Program Rule compliance costs, Aug. 69 compliance procedures, Aug. 69 content requirements, Aug. 69 emergency response program requirements, Aug. 67

hazard assessment requirements, Aug. 67 management program requirements, Aug. 67

and OSHA's Process Safety Management Rule compared, Aug. 65 prevention program requirements, Aug. 69

program requirements, Aug. 67 rules finalized on reducing air pollution from waste facilities, July 27 self-policing policy on violations

self-policing policy on violations issued, Feb. 25 Toxic Release Inventory may be expanded, Jan. 20

toxic release inventory reporting may be expanded, Nov. 29

Envisioneer program at Penn State for improving engineering education, Mar. S6 Equation, Kremser, for evaluating liquid/liquid evaluation, Apr. 59

Exam, Fundamentals of Engineering (FE/EIT), strategies for conquering, Sept. \$15 Exchanger, heat, baffling calculations for,

Apr. 72 Experience, value of, Oct. 84 Explosions

of heat transfer fluid mist, Mar. 52 suppression systems for, Mar. 22

F

Fedworld database for environmental information, July 74

Fieldbus standard for communication among instrumentation and control systems, May 9 field trial set for Japan, Dec. 23

Film viscosity, thin ionic micellar liquid, model developed for, July 19 Filner, Rep. Robert, urges engineers to get involved, July 25

Filters, electromagnetic, May 59
Finite element analysis in magnetic separator design, May 57
Fire and gas detectors for plants, Oct. 71
Flooring systems acrylics for, Sept. 57

design and construction of, Sept. 55 epoxy novolacs for, Sept. 56 expoxies for, Sept. 55 polyurethane finishes for, Sept. 56 polyurethane mortars for, Sept. 56 testing of, Sept. 56

[Flooring systems] vinyl esters for, Sept. 57 single-phase, formulae of API and ASME, Dec. 29 Flow, two-phase of cohesive particles, model for, June 19 effect of on relief capacity. Dec. 31 neous equilibrium model method, via integral equations, Dec. 32 methodology of, Dec. 34 sizing of relief devices for piping, Dec. 28 sonic, in safety-relief valves, formulas for gas capacity conversions. June 56 onic velocity and critical flow, Dec. 48 Flow meters differential pressure, Jan. 25 mass, Jan. 29 selection guidelines. Jan. 22 variable area, Jan. 32 velocity, Jan. 27 olumetric, Jan. 31 Fluid Flow for Chemical Engineers, book review, Nov. 82 Fluids, misting of suppressed in metalworking operations, May 13 Fluids/solids handling barrier/isolation technology for containment in batch operations, Dec. 72 centrifugal pump warm up, Jan. 42 level measurement devices for bulk solids, Feb. 50 magnetic gear numps, an alternative to sealless centrifugals, Mar. 62 magnetic separators for removing unwanted materials, May 56 mixing of dry bulk solids, Nov. 72 rotating equipment, gas-barrier seals for, Oct. 58 seals, gas-barrier, for rotating equipment, Oct. 58 vacuum systems, misconceptions about, July 50 valve cavitation, minimization of, Aug. 52 Fly ash treatment process demonstrated, Apr. 22 "Focused What If" method for hazard analysis, July 75 Food and Drug Administration, legislation would speed review process. Apr. 24
Food Quality Protection Act replaces Delaney
Clause of 1958 legislation, Oct. 30 Fractionators, trayed, reflux/feed entry design of, Jan. 56 as energy source, Sept. 11 molten carbonate, Sept. 12 phosphoric-acid, Sept. 14 polymer electrolyte membrane, Sept. 18 solid oxide, Sept. 14 solid oxide/gas turbine, Sept. 18

Gages, vacuum, types of, July 51
Game teaches design concepts to students, Feb, S5
Gas and fire detectors for plants, Oct. 74
Gas capacity conversion formulas for sonic flow in safety-relief valves, June 56

Fundamentals of Engineering (FE/EIT) Exam,

strategies for conquering, Sept. S15

Fuzzy logic for process control, Nov. 60

hardware requirements for safe

safety interlocks for, July 45

light-off, July 48

Furnaces

Gases, processes for recovering sulfur from, Feb. 11 Gas explosions, suppression of, Mar. 22 Gasoline, regulation of by Clean Air Act. Jan. S9 Gas processing, supersonic steam and shock waves for, Oct. 26 Generators, steam, See Heat recovery steam generators Georgia Tech career fair, Nov. \$5 Gigaporous particles, permeability of modeled, Apr. 21 Glass for spent plutonium storage, Mar. 17 Glassification, plasma, for radwaste, July 19 Government regulation and environmental protection, Jan. S12 Graduates face tougher job market, July 13 Great Lakes cleanup focuses on sediment, Groundwater sampler system, Dec. 18 Guideword analysis method for identifying pollution prevention opportunities, Aug. 74 Handbook of Double Containment Piping Systems, book review, Oct. 92 Hazardous waste facilities, regulation would

Systems, book review, Oct. 92
Hazardous waste facilities, regulation would ease access to information about, Jan. 21
Hazardous-waste site cleanup databases of EPA, July 72
Health and safety training. CD-ROMs for, Sept. 45
Health and safety training. CD-ROMs for, Sept. 45
Heaters, band, for plastics processing, May 39
Heat Exchanger Network Synthesis: Process Optimization by Energy and Resource Analysis, book review, June 67
Heat exchangers
baffling calculations for, Apr. 72
brazed, use of, Nov. 44
life of, one-third rule for, June 53
turbulent, AT and AP in, June 49
Heating systems, bot oil, troublesbooting,

Heat pumps, for CPI applications, Feb. 42 Heat recovery steam generators auxiliary firing and system efficiency, Aug. 40 catalyst use in, Aug. 44 design features of, Aug. 36

design temperature profile calculations, Aug. 35 exhaust-fired designs, Aug. 40 natural vs. forced circulation designs, Aug. 42 temperature profiles and steam generation

in, Aug. 33 turbine exhaust characteristics, Aug. 44 unfired and supplementary-fired, Aug. 37 Heat transfer fluid mist explosions, Mar. 52

Heat transfer performance of tantalum, Mar. 34 Hot oil heating systems oxidation in, Dec. B3 thermal cracking in, Dec. 62 How to Study, book review, Jan. S8

Hydrocarbon oxidations, oxyge.1 for, Nov. 66
Hydrocarbons, polynucleararomatic, removing
from soil, Nov. 13
Hydrochloric acid release reporting
requirements reduced by EPA. Sept. 24

requirements reduced by EPA, Sept. 24 Hydrogen-bonded compounds, liquid/liquid extraction for, Apr. 57 Illinois Institute of Technology, Energy, Environment, and Economics Program. Feb. S6 Industrial Mixing Fundamentals With Applications, book review, May 78 Instrument for detecting corroded pipe, Oct. 25 Instruments

detectors for fire and gas in plants, Oct. 74 fieldbus standard for communication with, May 9 level measurement, selection of, Oct. 64 Insulin response to glucose challenge, model

for, Sept. 22.
Intermediates and the Process Patent
Amendments Act, July 28
International engineering education exchan

International engineering education exchange programs, Dec. S1 Internet Resource Conservation and Recovery Act

resource conservation and networkly Act Policy Compendium available on, Jan. 21 sites for job seekers. Apr. 86 student-authored World Wide Web home pages sought, Sept. \$13 Web Sights editorial department debuts

Web Sights editorial department debuts in Chemical Engineering Progress, June 72. Internship programs for summer, Dec. S8 Interviewing techniques for job applicants, June 94.

Inventions, U.S. and Chinese patent law, Jan. 18

JK

Job market faced by new graduates is tougher, July 13 Job searching don't delay after termination or graduation, Mar. 95 Internet sites for, Apr. S6 online tools for, Apr. S6 Kremser equation for evaluating liquid/liquid evaluation, Apr. 59

L

Languages, foreign, facility required for working in the global marketplace, Dec. S6 Law, patent, in U.S. and China, Jan. 18 Lead paint, removal of, Jan. 50 Legislation
Clean Air Act, congressional action on, Feb. 22 Clean Water Act, congressional action on, Feb. 22 Congress leaves work undone, Feb. 22 Food and Drug Administration Performan and Accountability Act, Apr. 24 intermediates and the Process Patent Amendments Act, July 28 Pesticide law replaces Delaney Clause, Oct. 30 R&D and environment, outlook for, Mar. 20 risk and regulatory reform, congressional action on, Feb. 22 Safe Drinking Water Act, congressional action on, Feb. 22 Superfund, congressional action on, Feb. 22 Tax credit, R&D, congressional action on, Feb. 22 Level measurement devices

pressure switches for, Feb. 51

for bulk solids, Feb. 50

electrodes for, Feb. 54

capacitance probes for, Feb. 51, 53

and radiation absorption, Feb. 51, 55

[Level measurement devices] and radio-wave ranging, Feb. 55 rotating paddles for, Feb. 51 technology and instruments, selection of, Oct. 64

and temperature compensation, Feb. 52 ultrasonic, Feb. 52 vibrating damping technique, Feb. 30

LIDAR (light detection and ranging) device for detecting refinery and plant emissions, May 13 Lightning Never Strikes Twice and Other

False Facts, book review, Oct. S8
Lime, hydrated, can reduce selenium emitted
by incinerators. Aug. 19

by incinerators, Aug. 19 Linings, for tanks to reduce VOC emissions, Nov. 56

Linings for vessels elastomer, Dec. 68 fluoropolymer, Dec. 68 inorganic, Dec. 67 organic, Dec. 67 selection of, Dec. 64 thermoset, Dec. 68

Liquid/liquid extraction for high-boiling organics, Apr. 57 for hydrogen-bonded compounds, Apr. 57 Kremser equation for evaluating, Apr. 59 for low-concentration acids. Apr. 57 strengths and limitations of, Apr. 58 for wastewater problems, Apr. 56 for zero-volatility compounds, Apr. 57

M

Machining-fluid mist suppressed, May 13 Magnetic separators for removing unwanted materials, May 56 Major in Success, book review, Jan. S8

Major in Success, book review, Jan. S8 Management of Change, software review, Sept. 45

Materiais
alloys for caustic soda service, May 48
contings selection for plants, Aug. 81
concrete, guidelines for longevity of, Sept. 54
construction, guidelines for selecting,

explosion clad steel for corrosion protection, July 40

gigaporous particles, permeability of modeled, Apr. 21 laminated matrix composites, Jan. 9

laminated matrix composites, Jan. 9 lead paint removal projects, Jan. 50 for seals, Apr. 80 for secondary-containment concrete, Feb. 56

service factors should be considered when specifying, June 38 superconducting high-temperature wire for transmitting electricity, May 14 tantalum for combatting corrosion in

tantaum for comonting corrotion in harsh environments, Mar. 32 zirconium tungstate shrinks when heated, May 12 MBA degree for engineers and scientists, Feb. S7

Measurement and control controllers, one-directional control of, May 61

distributed control systems for pilot plants, Aug. 58 dynamic problems, simulation and statistical software for solving, Mar. 44 fluid phase cquilibria, prediction of using molecular simulation, Feb. 65 fuzzy logic for process control, Nov. 60 process optimization techniques, Dec. 51 [Measurement and control] simulation software, getting engineers to use it, Sept. 68 statistical tools for process control, Oct. 47 vacuum system specification, Jan. 48 vapor/fiquid equilibrium data estimation, Apr. 65

Membranes adsorptive, recuperative parametric pumping in leads to two separation mechanisms, Jan. 9 zeolite, method for creating developed, Nov. 22 system for sweetening natural gas,

Feb. 14
Memory devices, computer, nanostructure
consortium formed to develop, Apr. 14
Mercury emissions control technology for

coal-fired power plants, May 20
Mercury pollution, technology for detecting
and capturing, Jan. 10
Metals and tantalum, properties and costs
compared, Mar. 23

compared, Mar. 23 Metalworking operations, fluid misting suppressed in, May 13

Microbes used to remove sulfur from sour natural gas, Feb. 13

Micromachines with integrated circuit "brains" developed by Sandia National Labs, July 20

Microtechnology-based chemical systems, Apr. 12 Microwave vitrification of radioactive

waste, June 17 Miniaturization of chemical processes, Apr. 12 Mist, heat transfer fluid, explosion of, Mar. 52 Mist, inc.

of dry bulk solids, Nov. 72 engineered tissue composition improved by, Mar. 15

Models
for bidirectional fixed-bed reactor
performance, Oct. 20
for cohesive particles flow, June 19
for insulin response to glucose, Sept. 22
process, and chemical kinetic schemes,
Mar. 58

process simulation, techniques for describing physical properties, Oct. 35 for pump performance, Sept. 35 for thin ionic micellar liquid film viscosity, July 19

Molasses used to treat TNT-contaminated soil, Nov. 24

Molecular simulation, prediction of using fluid phase equilibria, Feb. 65 Molecules, biosensor detects force between, May 16

Monomer Recovery Unit for treating polyethylene vent streams, Aug. 21 Murphree tray efficiency prediction, new approach for finding, Aug. 46

N

Nanoscale electronics, Nov. 22 Nanostructure consortium formed for developing computer memory devices, Apr. 15 National Emission Standards for Hazandous

Air Pollutants
for polymers and regins finalized by

EPA, Aug. 28 source category list expanded by EPA, Aug. 28

National Institute of Science and Technology, FY97 budget request, May 22 National Science Foundation, FY97 budget request, May 22

Natural gas, membrane system for sweetening, Feb. 14 Nozzles

operation of at various back pressures, Dec. 29 short, nonequilibrium effect in, Dec. 46 Nuclear magnetic resonance being used to investigate pore structure and fluid phase distributions in porous media, Feb. 18

0

Occupational Safety and Health Administration 1,3-butadiene, permissible exposure level reduced for, Dec. 26

Process Safety Management Rule, administrative procedure development, Sept. 62

document-management system for, Sept. 64 electronic document control, Sept. 66 operating procedures, Sept. 61 procedures approval, Sept. 65 and Risk Management Program Rule of EPA compared, Aug. 65 reasons for violations of, Sept. 59 style guide for, Sept. 63

regulations simplified by, May 24 respirator program requirement, May 65 Odor problems of plants, Jan. 35

One-third rule for predicting heat exchanger life, June 53 Open Computer-Aided Process Engineering Consortium working on standardizing simulator software. May 11

Optimization of processes, techniques for, Dec. 51

Organic chemicals to be regulated by new source performance standards, Apr. 26 Organics, liquid/liquid extraction for, Apr. 57 OSHA's Oxygen for hydrocarbon oxidations, Nov. 66

Overseas engineering education exchange programs, Dec. S1
Ozone and particulate matter standards,

revision of linked by EPA, Aug. 25

Þ

Packed towers, maldistribution in, May 69
Paint, lead, projects for removing, Jan. 50
Paint solvents, hazardous pollutants in, Nov. 55
Particles, cohesive, model for flow of, June 19
Particles, gigaporous, permeability of
modeled, Apr. 21
Particulate matter and ozone standards.

Particulate matter and ozone standards, revision of linked by EPA, Aug. 25 Patent law, in U.S. and China, Jan. 18 PCB import rules loosened by EPA, May 24 PCBs destroyed by gas-phase, thermochemical process, Aug. 12

Penn State's Envisioneer program for improving engineering education, Mar. S6 Pensions, Congress takes action on, June 20 Perchloroethylene destermined not to be a VOC by EPA, Apr. 26

Pesticide law eliminates Delaney Clause, Oct. 30 Pharmaceutical intermediates and the Process Patent Amendments Act, July 28 Phenol extraction, solvents for, Apr. 61

Physical properties, description of for process simulation, Oct. 35 The Physics of Star Track, book review, Sept. S12 Piccolo, for performing sizing calculations,

added costs of, Aug. 63 improving operability, Aug. 61 maintaining and validating, Aug. 63 maximizing yield and quality, Aug. 62 Pipe corrosion detected by instrument, Oct. 25 Piping, relief, for two-phase flow, Dec. 28 Plants amine, process removes acid gas in, Mar. 17 capital cost estimation, June 26 miniaturization of, Apr. 12 odors problems, identifying and solving, Jan 35 pollution prevention plans, Nov. 30 safety survey, Mar. 11 Plasma glassification for radwaste, July 19 Plastics: Product Design and Process Engineering, book review, Sept. 82 Plastics band heaters for processing, May 39 recycling competition, Feb. S1 recycling of without sorting, Nov. 23 Plutonium, spent, glass for storage of, Mar. 17 Pollution control catalytic oxidation for controlling VOCs, Mar. 37 coatings without volatile organic compounds, Nov. 54 continuous emissions monitoring systems data handling for, Feb. 33 dilution-extractive systems, Feb. 31 fully extractive systems, Feb. 30 path monitoring in situ systems, Feb. 32 point monitoring in situ systems, Feb. 32 selection of, Feb. 28 vs. stack sampling, Feb. 34 vendor selection, Feb. 34 EPA issues self-policing policy on violations, Feb. 25 global climate agreement has industry hot under the collar, Sept. 23 Great Lakes cleanup, Aug. 11 guidewords for identifying prevention portunities, Aug. 74 LIDAR (light detection and ranging) device for detecting refinery and plant emissions, lime, hydrated, can reduce selenium emitted by incinerators, Aug. 19 of mercury, Jan. 10 mercury emissions control at coal-fired power plants, May 20 rchloroethylene determined not to be a VOC by EPA, Apr. 26 Prince William Sound cleanup after Valdez oil spill, Mar. S1 soil, removal of polynucleararomatic hydrocarbons, Nov. 13 soil cleaning via electrical fields, Oct. 22 sorbent cleans hot coal gas, May 16 VOC emissions from aboveground storage tanks, May 42 Pollution prevention catalytic extraction process for, Feb. 19 databases of EPA, July 73 electrochemistry for, Oct. 11 groundwater sampler for, Dec. 18 plans for plants, Nov. 30 toxic release inventory reporting, EPA may expand, Nov. 29

Pollution Prevention Act, seven industry

Pollution Prevention via Process and Product

Modifications, book review, Feb. 84

groups subject to reporting

requirements, Aug. 28

Pilot plants

distributed control systems

Polymers and resins National Emissions Standards for Hazardous Air Pollutants finalized by EPA, Sept. 24 Polynucleararomatic hydrocarbon remediation, in situ, Nov. 14 removing from soil, Nov. 13 Poplar trees used to decontaminate soil, Nov. 20 Pore structure and fluid phase distributions in porous media, nuclear magnetic resonance being used to investigate, Feb. 18 Power/mass correlation for predicting optimum ΔT and ΔP turbulent heat exchangers, June 51 Pressure drop and temperature difference in turbulent flow heat exchangers, June 49 Pressure relief valves, sizing of, Dec. 28 Pressurized and purged equipment, ANSI/NFPA standard for, Feb. 61 Prince William Sound cleanup after Valdez oil spill, Mar. S1 Proceedings of the International Symposium on Runaway Reactions and Pres Relief Design, book review, Feb. 84 Process Capability Index, Oct. 47
Process control, fuzzy logic for, Nov. 60
Process Data eXchange Institute developing
protocols for exchange of process engineering data, May 12 acid gas absorption, Mar. 17 for aromatics removal from soils, Nov. 13 Bleach Filtrate Recycle technology for reducing waste effluents in bleaching pulp, Feb. 18 catalytic extraction for pollution prevention and recycling, Feb. 19 Catalyzed Electrochemical Oxidation, nonthermal waste treatment alternative to incineration, Jan. 9 for cleaning contaminated lakes and rivers, Aug. 11, 15 for fly ash treatment demonstrated, Apr. 22 for hydrofluoric acid reduction in fabricating silicon products, OCt. 20 lime, hydrated, can reduce selenium emitted by incinerators, Aug. 19 liquid redox sulfur recovery, Feb. 12 for mercury detection and capture, Jan. 10 miniaturization of, Apr. 12 for recovering monomer from polyethylene vent streams, Aug. 21 simulation of, decision tree navigation, simulation of, techniques for describing physical properties, Oct. 35 for sulfur recovery from gases, Feb. 11 Process model development, Mar. 56 Process optimization techniques, Dec. 51 Process Patent Amendments Act and pharmaceutical intermediates, July 28 Process Performance Index, Oct. 48 Process safety management, writing procedures for, Sept. 59
Process Safety Management Rule of OSHA. and Risk Management Program Rule of EPA compared, Aug. 65 Product stewardship resource chemical suppliers, Sept. 52 producer panels, Sept. 51 Responsible Care program, Sept. 51 safety audits, Sept. 52 safety literature, Sept. 52 trade association meetings, Sept. 51 training for transporters, Sept. 53

Professional development

academia, threats to, Oct. 80

[Professional development] consulting as a career, May 25 contract engineering as a career, May 36 employment, transition to a new job, June 92 experience, value of, Oct. 84 interviewing techniques for job applicants, June 92 job, starting of, June 96 job search, don't delay after termination or graduation, Mar. 95 retirement benefits, President and Congress take action on, June 20 salaries of ChEs continue steady rise, Aug. 109 salary and benefits negotiation, June 95 working in foreign cultures, Dec. S7 Projects, simple payout period for assessing. June 33 Pulp and paper virtual sensors in manufacturing, Dec. 13 technology development program, Dec. 21 available net positive suction head, and acceleration head, Sept. 30, 32 cavitation damage, Sept. 31 centrifugal, proper warm up, Jan. 42 heat coefficient of performance for, Feb. 44 for CPI applications, Feb. 42 miniature unit under development, Apr. 19 for seawater desalination plant, Feb. 48 working fluid selection, Feb. 46 magnetic gear, economic and performance advantages over sealless centrifugals, Mar. 62 minimum suction head required in the field, Sept. 32 net positive suction head required, definition of, Sept. 26 net positive suction head required, factors influencing, Sept. 28 for pump performance, Sept. 35 reciprocating positive-displacement, preventing damage in, Sept. 26 seals, gas-barrier, for, Oct. 60 Purged and pressurized equipment, ANSI/NFPA standard for, Feb. 61 and design, integration of waste minimization into, June 58 expenditures, FY97 budget proposes 2% increase, May 22 legislation, prospects for, Mar. 17 Radiological Worker Training, software review, Sept. 48 plasma glassification process for treating, July 19 vitrification for, June 13 Reactions and separations cavitation, harnessing of to improve processing, July 57 distillation-column debottlenecking options, June 42 distillation test runs, making the most of, Feb. 72 naldistribution in packed towers, May 69 Murphree tray efficiency prediction approach for finding, Aug. 46 oxygen for hydrocarbon oxidation Nov. 66

process model development, Mar. 56

reflux/feed entry design, Jan. 56

[Reactions and separations]

vacuum-towers, improving performance of, Sept. 36

Reactor, batch relief systems, sizing of, Apr. 46 Reactors, bidirectional fixed-bed, performance of modeled, Oct. 20

Reboilers, shellside, baffling for, Apr. 79 Recycling of plastics design and economic analysis for, Feb. S1

without sorting, Nov. 23 Reflux/feed entries for trayed fractionators.

Jan. 56 Refrigerants for heat pumps, Feb. 47

Refrigeration leak repair regulations, training module developed by EPA, Mar. 21 Regulations

air pollution, obsolete, eliminated by EPA, June 22 Code of Federal Regulations and air

emissions monitoring methods, Feb. 38 Compliance Assurance Monitoring rule issued by EPA, Oct. 32 EPA finalizes rules on reducing pollution for waste treatment facilities, July 27 Superfund and regulatory reform hit

roadblocks, Jan. 20 Relief devices for piping, sizing of, Dec. 28 Relief systems for batch reactors, sizing

of, Apr. 46 Repetitive Motion Injuries, software review, Sept. 47

Resins and polymers National Emissions Standards for Hazardous Air Pollutants finalized by EPA, Sept. 24

source Conservation and Recovery Act Policy Compendium available on the Internet, Jan. 21

Respiratory protection program, May 64 Responsible Care program of Chemical Manufacturers Association, Sept. 50 Retirement benefits, President and Congress

take action on, June 20 Retirement Savings and Security Act unveiled

by President, June 20 Right-To-Know databases of EPA, July 73 Risk, and regulatory reform, congressional action on, Feb. 22

Risk analysis and environmental protection, Jan. S12

Risk Assessment and Management, Handbook for Environmental Health and Safety Professionals, book review. June 68

Risk assessment guidelines for cancer revised by EPA, June 22 Risk management databases of EPA. July 71

Risk Management Program Rule of EPA applicability of, Aug. 65 compared to OSHA's Process Safety Management Rule, Aug. 65 compliance costs, Aug. 67 compliance procedures, Aug. 67 content requirements, Aug. 67 emergency response program requirements,

Aug. 67 hazard assessment requirements, Aug. 67 management program requirements, Aug. 67 prevention program requirements, Aug. 67 Robot arm for inspecting underground storage tanks, Dec. 22

Rupture disks, sizing of, Dec. 28

Drinking Water Act, congressional action on. Feb. 22

Safety audits, "new paradigm" for, June 61 batch reactor relief systems, sizing of, Apr. 46 detectors for fire and gas in plants, Oct. 74 electrical equipment, pressurization for protection of in flammable atmospheres, Feb. 61

explosion suppression systems, Mar. 22 furnace interlocks, July 45 hazard analysis using the "focused what if?" method, July 75

HAZOP analysis drawbacks, July 75 and health training, CD-ROMs for, Sept. 45 heat transfer fluid mist explosions, Mar. 52 and materials selection, June 38 at plants, survey of, Mar. 11

procedures for process safety management, writing, Sept. 59 of process vent collection systems, Jan. 65 respiratory protection program, May 64 Risk Management Program Rule takes effect, Aug. 64

Safety and Health Management in the Nineties: Creating a Winning Program, book review, May 78 Safety Engineering, book review, Mar. 69

Safety-relief valves, sonic flow in. formulas for gas capacity conversions. June 56 Safe Use of Chemicals, software review,

Sept. 46 Safeware: Systems Safety and Computers,

book review, Jan. 81 Salaries of ChEs continue steady rise, Aug. 109 Salary and benefits negotiation, June 95 Salt dilution problem, software for solving, Mar. 44

Schools, graduate, on CD-ROM, Sept. \$12 Seals

alumina, Apr. 83 carbon-graphite, Apr. 80 gas-barrier, for rotating equipment, Oct. 58 gas-burrier, specification guidelines, Oct. 63 materials for, Apr. 80 silicon carbide, Apr. 81 for tanks, aboveground, to control VOC

emissions, May 42 tungsten carbide, Apr. 83 Seawater desalination plant, heat pump selection for, Feb. 48

Sediment, remediation of in Great Lakes. Aug. 11 Self-policing policy on violations issued by EPA, Feb. 25

Sensors, virtual for environmental applications, Dec. 13 for pulp and papermaking, Dec. 13

Separation mechanisms in adsorptive membranes, recuperative parametric pumping for determining, Jan. 9

Separators, magnetic, for removing unwanted materials, May 56 Simulation

of acoustic and hydrodynamic cavitation behavior, July 67 molecular, prediction of using fluid phase equilibria, Feb. 65

physical properties, selection of, Oct. 35 and statistical software for solving dynamic problems, Mar. 44 Simulation software

getting engineers to use it, Sept. 68 model creation guidelines, Sept. 70 modeling plant utilities, Sept. 70

Small Business Job Protection Act exempts workers from tax on educational aid from employers, Nov. 27

Social Security earnings limit raised, June 20, Nov. 27

Software ChemCad III used to solve salt dilution problem in tanks, Mar. 45

Open Computer-Aided Process Engineering Consortium working on standards for simulators, May 11

Process Data eXchange Institute developing protocols for exchange of process engineering data, May 12 process simulation and statistical, for solving dynamic problems, Mar. 44 Software reviews

Management of Change, Sept. 45 Radiological Worker Training, Sept. 48 Repetitive Motion Injuries, Sept. 47 Safe Use of Chemicals, Sept. 46

decontamination of using molasses, Nov. 24 polynucleararomatic hydrocarbons, cleanup of, Nov. 13 radioactive, cleanup of, June 15

Solvents for cleaning boilers, Sept. 74 paint, hazardous pollutants in, Nov 55 for phenol extraction, Apr. 61 Sonic flow in safety-relief valves, formulas

for gas capacity conversions, June 56 Sorbent removes suffur compounds from hot

coal gas, May 16
Standard, ANSI/NFPA, for purged and pressurized equipment, Feb. 61
Stationary source testing of emissions, Feb. 36 Statistical software for process control, Mar. 44, Oct. 47

atistical techniques to optimize processes, Dec. 51 Steam generators, heat-recovery, See heat transfer, Aug. 32

Steel, explosion clad applications for, July 42 for corrosion protection, July 40 technical and economic limitations, July 42 Steel structures, coating systems for

protecting, Aug. 81 udent Annual Program at Chicago Meeting, Oct. S1

Student-authored World Wide Web home pages sought, Sept. S13

Student Conference, Annual Chemical Engineering Career Paths Panel, Jan. S5 Employment Clearinghouse, Jan. S2 Graduate and Professional School

Fair, Jan. S1 Minority Affairs Committee panel discussion, Jan. S1 National Student Design Competition winners receive awards, Jan. S2

Plastics Recycling Competition, Jan. S2 Tyler, A. Lamont, named Outstanding Student Chapter Advisor, Jan. S2 Student Regional Conference calendar,

Jan. S2 Students, summer internship programs for, Dec. S8

Successful Industrial Experimentation, book review, Aug. 88 Sulfur recovery burner for commercialized, Dec. 22 from gases, processes for, Feb. 11

Summer internship programs, Dec. S8 Superconducting high-temperature wire for transmitting electricity, May 14 Superfund

congressional action on, Feb. 22

[Superfund] and regulatory reform hits roadblocks, Jan. 20

Suppression systems to mitigate explosions, Mar. 22 Survey, graduates face tougher market, July 13

Surveys on plant safety, Mar. 11 questionnaire on coping with workload, Apr. 64

workplace environment, Nov. 104

T

Tanks aboveground, controlling VOC emissions from, May 42 cooling and heating problem, Mar. 48 linings for, Nov. 56

pressurizing and depressurizing problem, Mar. 49

underground, robot arm for inspecting, Dec. 22

Tantalum applications of in CPI, Mar. 34 for corrossion control, Mar. 32 heat-transfer performance of, Mar. 34 hydrogen embrittlement of, Mar. 32 Tax credit, R&D, congressional action on,

Feb. 22 Thermal cracking in hot oil heating systems, Dec. 62

Thermal desorption process for treating contaminated sediment, Aug. 15 Thermocouples, properties of, Feb. 74 Thermodynamics of Pizza, book review, New. 58

Thin-film technologies, CD-ROM for teaching, Nov. S7

Tissue, engineered, mixing can improve composition of, Mar. 15

Total Quality for Safety and Professional Health, book review, Aug. 88
Towers, packed, maldistribution in, May 69
Toxic Release Inventory reporting may be expanded by EPA, Jan. 20, Nov. 29, Dec. 24
Training, aciety and health, CD-ROMs for,

Sept. 45
Trayed columns, new route for Murphree tray
efficiency prediction, Aug. 46

u

U.S. and Chinese patent law, Jan. 18 Ultrasound for cavitation cleaning beth, July 61 heterogeneous reactions involving immiscible liquids, July 60 homogeneous reactions, July 59 liquid whistle reactor, July 63 scale-up considerations, July 60 solid/liquid heterogeneous reactions, July 50 tube reactors, July 64 University of Michigan's Virtual Reality in

University of Michigan's Virtual Reality in Chemical Engineering Education Lab, Nov. S1

V

Vacuum, calculation of, July 53 Vacuum gage types, July 51 Vacuum systems level control in, July 55 misconceptions about, July 50 [Vacuum systems] piccolo for performing sizing calculations, July 54

specification of, Jan. 48
Vacuum technology for mercury pollution,
Jan. 14

Vacuum towers composition profile plots as troubleshooting tools, Sept. 42 packed, flood testing of, Sept. 39 performance improvement came studies, Sept. 36

pressure and level surging in, Sept. 37 vapor sidedraw control, Sept. 43 Valve cavitation

causes of, Aug. 52 minimization of, Aug. 56 prediction of, Aug. 53 Valves

of, Apr. 65

Vent collection systems

pressure relief, sizing of, Dec. 28, 30 safety-relief, sonic flow in, formulas for gas capacity conversions, June 56 Vapor/liquid equilibrium data, estimation

arrestors for, Jan. 75
design of, Jan. 65
exothermic reactions and reactive
chemicals, Jan. 72
explosion and flashback hazards, Jan. 71
flammability, estimating, Jan. 68
flammability diagrams, Jan. 69
flow-ratio control, Jan. 74
hazards, internal and external, Jan. 71
HAZOP analysis, Jan. 67
ignition sources, Jan. 70
mixing of streams in, Jan. 73
operating modes, Jan. 72
oxygen and hydrocarbon monitors, Jan. 77
pressare drop in, Jan. 76
process hazards review, Jan. 66

iemperature and pressure, effects of, Jan. 68 valves, isolation or block, Jan. 76 Vessel linings classomer, Dec. 68 fluoropolymer, Dec. 68 inorganic, Dec. 67 installation of, Dec. D7 organic, Dec. 67 selection of, Dec. 64 specification of, Dec. 69 thermoset, Dec. 69 thermoset, Dec. 69 Vibration damping in level measurement

Vibration damping in level measurement devices, Feb. 50 Virtual Reality in Chemical Engineering

Education Lab, Nov. S1 Virtual sensors for environmental applications, Dec. 13 for pulp and papermaking, Dec. 13

Vitrification for radwaste, June 13 VOCs catalytic oxidation for controlling, Mar. 37 coatings without volatile organic

compounds, Nov. 54 emissions from aboveground storage tanks, seals for controlling, May 42 halogenated, catalytic oxidation of, Mar. 42

W

Warmup systems for centrifugal pumps, Jan. 45 Waste facilities, EPA issues rules on reducing air pollution, July 27 Waste minimization integration of in R&D and design, June 58 [Waste minimization] pollution prevention plans, Nov. 30 Waste treatment

ceramic binders for solidifying hazardous materials, Dec. 13 Catalyzed Electrochemical Oxidation process, Jan. 9 of radioactive liquid, June 14

Wastewater problems, liquid/liquid extraction for solving, Apr. 56 Water and wastewater databases of EPA, July 72

Water quality standards videotapes available, Apr. 26

Web Sights, new Chemical Engineering Progress editorial department, June 72 Web sites

of interest to chemical engineers, Nov. S8 for job seekers, Apr. S6 Wetlands mitigation banks, policy eased on,

Jan. 21 What You Can Learn from Things That Go Wrong, book review, June 67

Wire, superconducting, under development for transmitting electricity, May 14 Worcester Polytechnic Institute's Zeolite

Crystal Growth research team, Oct. \$4 Workplace environment, survey on, Nov. 104 World Wide Web student-authored home pages on science and engineering sought, Sept. \$13

engineering sought, Sept. S13
Web Sights editorial department debuts in
Chemical Engineering Progress, June 72

7

Zeolite Crystal Growth research team at Worcester Polytechnic Institute, Oct. S4 Zeolite membrane, method for creating developed, Nov. 22 Zero-volatility compounds, liquid/liquid

extraction for, Apr. 57 Zirconium tungstate shrinks when heated,

Author Index

Able, S., Sept. 26 Adams, W. V., Oct. 58 Allen, C., Dec. 64 Anderson, M. J., Dec. 51

Baker, A., May 78 Banker, J. G., July 40 Basu, P. K., Aug. 58 Bidwell, J., May 64 Bird, R. B., Oct. 80 Bond, G. G., Sept. 50 Bowry, E. V., Aug. 81 Brown, C., May 42 Buccker, B., Sept. 72 Burns, R. H., Mar. 32

Carlson, E. C., Oct. 35 Carson, J. W., Nov. 72 Chatrathi, K., Mar. 22 Chu, W., Mar. 37 Clark, D. G., Jan. 65 Coleman, R. M., Jan. 109 Colt, W. J., July 109 Cusack, R. W., Apr. 56

Dahl, D., Nov. S5

Davis, J. H., June 61 Dixon, P., May 42 Duerr, W. W., Aug. 74 Dolenc, J. W., Jan. 22

Easterbrook, N. C., Nov. 66 Ekholm, E. L., May 26

Fair, J. R., June 42 Febo, H. L., Jr., Mar. 52 Fitzgerald, R. W., Feb. 36 Fleming, B., Jan. 56 Forde, P. T., Mar. 95 Freeman, H., Feb. 84

Ganapathy, V., Aug. 32 Gardellin, D., Aug. 52 Gelegenis, J. J., Feb. 36 Gente, S. B., Aug. 46 Goodman, L., Apr. 93, July 75 Gordon, S. W., Feb. 72 Gouchoe, S., Nov. 30 Grossel, S. S., Feb. 84, Oct. 98 Gunardson, H. H., Nov. 66

Hanson, D., Feb. 72 Hartman, E. L., Jan. 56 Haseltine, D. M., June 26 Horwitz, B. A., Mar. 44, Sept. 68, Oct. 84 Hoyt, K. A., Sept. 36 Hsu, K. F., July 70 Hughson, R. V., Sept. 45 Hutton, D., Oct. 50

Ippoliti, T., Feb. 56 Jacimovic, B. M., Aug. 46 James, M., Nov. 30

Kaelin, A. B., Jan. 50 Killat, G. R., May 68 Kirby, G. N., Mar. 69, June 38, Oct. 71 Kister, H. Z., Sept. 36 Kletz, T., Jan. 81, June 67

Klump, S., May 39

Knack, F. H., May 78, June 61 Knight, E. A., Feb. 50 Kolluru, R. V., Aug. 88 Kontorchik, J., Sept. 54 Koumoutsos, N. G., Feb. 42 Kumar, P., Mar. 32 Kunesh, J. G., July 82

Leung, J. C., Dec. 28 Li, H. H., Nov. 60 Lloyd, A., Oct. 74 Lunsford, K. M., Nov. 44 Luper, D., June 58, Sept. 83 Lynch, K. M., Nov. 30

Marchlik, Aug. 64
Martin, G. R., Jam. 56, Feb. 72
Masch, R. C., Feb. 67
Masch, R. C., Feb. 61
McGrane, B. Sept. 82
McGrath, P. J., June 92
Mentzer, W. P., Sept. 59
Motolkar, V. S., July 57
Morgan, R. E., Nov. 54
Mukesh, D., Feb. 110
Mukherjee, R., Apr., 72
Murugan, P., Nov. 60
Myerson, E. B., July 50

Nasr, A. M., Mar. 62 Nault, L. G., Oct. 84 Nocera, A. J., Sept. 68 Norrgran, D. A., May 56 Octinger, J., Dec. 62

Pandit, A. B., July 57 Peters, J. K., June 56 Pietsch, W., Apr. 29, Sept. 82 Pugh, J. R., Feb. 50

Quirke, N., Feb. 64

Radeloff, R. L., May 36 Rahe, H., Dec. 72 Reed, H. J., Apr. 65 Rey, T. D., May 68 Rhinehart, R. R., Nov. 60 Rhoad, R., Sept. 36 Richter, S. H., Apr. 46 Rose, M. F., Nov. 30 Rosenzweig, M. D., Apr. 64, Nov. 104 Rossiter, A. P., June 68 Royal, T. A., Nov. 72

Sands, N. P., May 61 Schillmoller, C. M., May 48 Schoenmaker, J. W., July 45 Scott, C. D., May 78 Scibert, A. F., June 42 Semple, T. C., Mar. 56 Shafer, M. J., Sept. 54 Shafer, M. J., Sept. 54 Shahani, G. H., Nov. 66 Sholette, W., Oct. 64 Shunta, J. P., Oct. 47 Siegell, J. H., Jan. 35 Singh, P. J., Sept. 26 Siveck, R., Mar. 22 Sloley, A. W., July 30 Spielmann, P. C., Aug. 58 Steinmeyer, D., June 49 Sullivan, D. A., July 70 Sylvester, R. W., Jan. 65

Thomas, C. D., July 45 Thorwart, L. J., Apr. 80 Troxel, T. G., Nov. 72 Turner, D., Apr. 93 Turner, F., Apr. 46

Usher, S. M., Nov. 30

Valiulis, J. V., Mar. 52 Vaughen, B. K., June 68

Walker, K., Feb. 28
Walter, R. J., Sept. 59
Whitcomb, P. J., Dec. 51
Whitesell, M. P., Feb. 56
Windawi, H., Mar. 37
Woinsky, S. G., June 33
Woodside, O. W., Jan. 42
Worstell, J. H., Mar. 56, Aug. 88, Nov. 82

Yoest, H., Feb. 36

Index to Advertisers

| Advertiser | Page Number | Reader Service Number | Advertiser | Page Number | Render Service Number |
|------------------------|-------------|--------------------------|----------------------|-------------|--------------------------|
| A D Little | 14 | 21 | Koch Eng | 1 | 14 |
| AIChE Continuing Ed | 61 | 34 | Koch Eng | | 19 |
| AIChE Petrochem | | | New Logic | 16 | 23 |
| Avesta Sheffield Inc | | 26 | Pape Scientific | | 17 |
| | | | Sagian Incorporated | | 24 |
| Calgon Carbon | 12 | 20 | Screw Conveyor Cor | p | 35 |
| CCPS | | | Seabury & Smith | Cov. 3 | 12 |
| Chemineer Inc | 88 | 37 | Simulation Sciences | 2 | 15 |
| Continental Disc | 20 | 27 | Stat-Ease Inc | 90 | 38 |
| DNV Technica | 21 | 29 | Stokes Vacuum Inc. | 22 | 20 |
| Ertel Engineering | 23 | 30 | Sulzer Canada Inc | | 22 |
| Fauske & Assoc | | 16 | Svedala Pump & Pro | cess | 18 |
| Fike Corp | | 39 | Tracerco | 18 | 25 |
| Hazards Research Corp. | | 32 | UIC Inc. | 25 | 31 |
| Huls Ag | Cov. 2 | 11 | United Eng. Trustees | Inc | 3 |

